CLAIMS

What is claimed is:

1. A method of treating cancer in a patient in need thereof comprising administering to the patient a therapeutically effective amount of at least one chemotherapeutic agent and at least one immunoconjugate, wherein the immunoconjugate comprises at least one cell binding agent and at least one anti-mitotic agent.

2. The method of claim 1, wherein the cancer is a cancer of the breast, colon, lung, prostate, kidney, pancreas, brain, bones, ovary, testes or a lymphatic organ.

3. The method of claim 1, wherein the cancer is lung cancer.

4. The method of claim 3, wherein the lung cancer is a small cell lung cancer.

5. The method of claim 1, wherein the cancer is colon cancer.

6. The method of claim 1, wherein the anti-mitotic agent is a maytansinoid.

7. The method of claim 6, wherein the maytansinoid is DM1.

8. The method of claim 1, wherein the anti-mitotic agent is a *Vinca* alkaloid, a dolastatin, or a cryptophycin.

9. The method of claim 8, wherein the *Vinca* alkaloid is vincristine, vinblastine, vindesine or navelbine; wherein the dolastatin is dolastatin 10 or dolastatin 15; and wherein the cryptophycin is cryptophycin 52 or cryptophycin 1.

10. The method of claim 1, wherein the cell binding agent is a monoclonal antibody or a fragment thereof.

11. The method of claim 10, wherein the monoclonal antibody or fragment thereof is a humanized monoclonal antibody or fragment thereof.

12. The method of claim 10, wherein the monoclonal antibody or fragment thereof is capable of binding to an antigen expressed by the cancer cell.

13. The method of claim 10, wherein the monoclonal antibody or fragment thereof is capable of binding to a CD56 antigen.

14. The method of claim 10, wherein the monoclonal antibody or fragment thereof is humanized N901 or humanized C242.

15. The method of claim 10, wherein the monoclonal antibody or fragment thereof is Fv, Fab, Fab' or $F(ab')_2$.

16. The method of claim 1, wherein the chemotherapeutic agent is a taxane compound.

17. The method of claim 16, wherein the taxane compound is paclitaxel or docetaxel.

18. The method of claim 1, wherein the chemotherapeutic agent is a compound that acts through a taxane mechanism.

19. The method of claim 18, wherein the compound that acts through a taxane mechanism is an epothilone compound.

20. The method of claim 19, wherein the epothilone compound is epothilone A, epothilone B, epothilone C, epothilone D, epothilone E or epothilone F.

21. The method of claim 1, wherein the chemotherapeutic agent is a platinum compound.

22. The method of claim 21, wherein the platinum compound is cisplatin, carboplatin, oxaliplatin, iproplatin, ormaplatin, or tetraplatin.

23. The method of claim 21, wherein the chemotherapeutic agent further comprises at least one epipodophyllotoxin compound.

24. The method of claim 23, wherein the epipodophyllotoxin compound is etoposide or teniposide.

25. The method of claim 1, wherein the chemotherapeutic agent is a camptothecin compound.

26. The method of claim 25, wherein the camptothecin compound is camptothecin, topotecan, irinotecan or 9-aminocamptothecin.

27. The method of claim 1, wherein the chemotherapeutic agent is a compound that inhibits DNA topoisomerase I.

28. The method of claim 1, wherein the immunoconjugate is administered in an amount of about 100 ng to about 10 mg/kg body weight once per week.

29. The method of claim 1, wherein the immunoconjugate and chemotherapeutic agent are administered separately.

30. The method of claim 1, wherein the immunoconjugate and chemotherapeutic agent are administered as components of a single composition.

31. The method of claim 1, wherein the immunoconjugate and chemotherapeutic agent are administered parenterally.

32. The method of claim 31, wherein the immunoconjugate and chemotherapeutic agent are administered intravenously.

33. A method of modulating the growth of a selected cell population comprising administering to the selected cell population a therapeutically effective amount of at least one chemotherapeutic agent and at least one immunoconjugate, wherein the immunoconjugate comprises at least one cell binding agent and at least one anti-mitotic agent.

34. The method of claim 33, wherein the selected cell population comprises cells selected from the group consisting of a cancer, an autoimmune disease, a graft rejection, a graft versus host disease, a viral infection, and a parasite infection.

35. The method of claim 33, wherein the method of modulating the growth of a selected cell population is a method of modulating the growth of cancer cells.

36. The method of claim 33, wherein modulating the growth of cancer cells comprises inhibiting the proliferation of cancer cells.

37. The method of claim 33, wherein modulating the growth of cancer cells comprises reducing the rate of cell division of the cancer cells as compared to the rate of cell division in untreated cancer cells.

38. The method of claim 33, wherein modulating the growth of cancer cells comprises killing cancer cells.

39. The method of claim 33, wherein modulating the growth of cancer cells comprises preventing metastasization of the cancer cells.

40. A composition comprising at least one chemotherapeutic agent and at least one immunoconjugate, wherein the immunoconjugate comprises at least one cell binding agent and at least one anti-mitotic agent.

41. A kit comprising at least one chemotherapeutic agent and at least one immunoconjugate, wherein the immunoconjugate comprises at least one cell binding agent and at least one anti-mitotic agent.

42. A method of treating an autoimmune disease, a graft rejection, a graft versus host disease, a viral infection or a parasite infection in a patient in need thereof comprising administering to the patient a therapeutically effective amount of at least one chemotherapeutic agent and at least one immunoconjugate, wherein the immunoconjugate comprises at least one cell binding agent and at least one anti-mitotic agent.

43. The method of claim 42, wherein the autoimmune disease is systemic lupus, rheumatoid arthritis or multiple sclerosis; wherein the graft rejection is a renal transplant rejection, a liver transplant rejection, a lung transplant rejection, a cardiac transplant rejection or a bone marrow transplant rejection; wherein the viral infection is a CMV infection, an HIV infection, or AIDS; and wherein the parasite infection is giardiasis, amoebiasis or schistosomiasis.